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NOTE ON THE GENITAL ORGANS OF ZAITHA.

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THE hemipterous genus *Zaitha* has a remarkable structure of the inner genital organs, particularly in the male, which deserves to be made known. Leidy (*History and Anatomy of the Hemipterous Genus Belostoma*) assumes, as I believe most, if not all, entomologists have subsequently done, that *Belostoma* and *Zaitha* are closely related genera of the same family. He states (*loc. cit.*, p. 59): "The principal marks of distinction between *Belostoma* and *Perthostoma* (*Zaitha*) are in the form of the promusci; the form of the antennæ; the form, comparative size, and situation of the patch of pubescence on the hemielytra; the form of the posterior tibiæ; and the size and form of the caudal setæ."

Leidy gives a figure (Fig. 6) of the male genitalia of *Belostoma haldemanum*, and describes the testes as "irregularly rounded masses, about two lines in diameter, . . . composed (each) of a single long convoluted tube. From the testicle passes off the vas deferens; at first narrow, it gradually enlarges as it passes backwards, is a little contorted, and finally joins the one of the opposite side to form the ductus ejaculatorius." Very probably Leidy assumed that these organs were similarly constructed in *Zaitha*, for he makes no reference to the latter in this regard.

An examination of the male genital organs of *Zaitha* has shown me that they are very different from those of *Belostoma*, as described by Leidy (I have not been able to procure *Belostoma* for personal study). Some fifty males of *Zaitha* were dissected by me recently (November and December), and the genitalia in all showed the following structure (Fig. *B*). Each testis (the testes are distinct from one another) is a large organ composed of five capsules or follicles (2 and 3). Each capsule is thickened in its anterior portion, but the posterior three-fifths

of its course is represented by a narrow tube. These five capsules are loosely connected together by tracheæ, but there is no tunic investing them; and their proximal ends are connected by terminal fibres (1). Distally they connect (at 4) and so join the vas deferens (5); and the vas deferens of the right side joining with that of the left, these internal organs terminate in the ductus ejaculatorius (6). The vasa are thin-walled, transparent tubes, considerably more delicate than the testes. In the drawing (Fig. B) I have represented the follicles more separated than they usually lie.

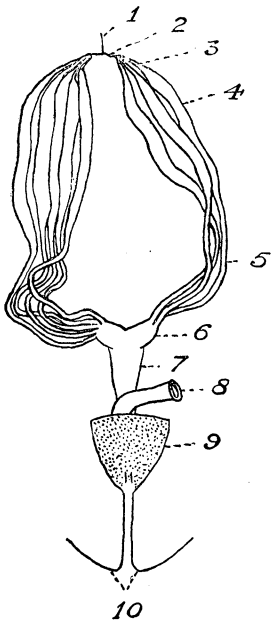


FIG. A.

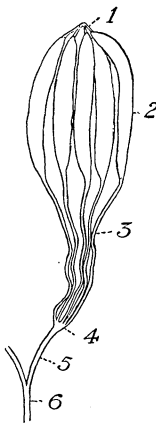


FIG. B.

In this description I call a follicle of the testis the two portions numbered 2 and 3 in the figure. In the testes studied in December both these parts are filled with spermatozoa, and I can find on sections no evidences of earlier spermatogenetic stages; consequently, the testes must be considered physiologically mature. But is the portion marked 3 really a portion of a testicular follicle, or is it not rather to be considered a vas deferens? If the latter alternative be correct, we should regard the five follicles (2) composing each testis to possess each a separate vas deferens (3), these five vasa deferentia joining posteriorly (at 4) to form a single vas (5). This point can be determined only by an examination of the organs in young individuals, with regard to whether in early stages spermatogonia and spermatocytes occur in the parts marked 3.

The ovaries differ in appearance according to the season of the year, *i.e.*, the state of growth of the ova. In June the ovarioles (follicles) are beaded in appearance. The small ova-

ries in December (Fig. *A*) have much the appearance of testes. Each ovariole is proximally attenuated (3), then enlarges (4), and distally is continued as a narrow tube (5). Perhaps, as in the testicle, the portion marked 5 should be regarded as an oviduct rather than a portion of an ovariole (follicle); in this case the portion marked 6 would be the undivided portion of the oviduct. Terminally is the vagina (7). (Fig. *A* represents all five ovarioles of the left ovary, but for the sake of clearness, only three ovarioles of the right ovary are shown; 8, the rectum; 9, the terminal ventral plate of the abdomen; 10, the outline of the posterior edge of the abdomen.) Proximally, the two ovaries are connected together by a fibrous thread (2, thread of Müller); and this thread is connected by another thread (1) to the pericardial wall. The dimensions in Fig. *B* should be doubled to be in the same scale of drawing as Fig. *A*.

From this description it will be seen that the female genital organs of *Zaitha* and *Belostoma* are quite similar, but that the male organs are very different. In *Belostoma* each testis consists of a single convoluted follicle; in *Zaitha*, of five distinct and well-separated, nearly straight follicles. Léon Dufour (*Recherches anatomiques et physiologiques sur les Hémiptères*) has not only given a most admirable description of the genitalia of Hemiptera, but also has insisted on their high value in taxonomy. Their worth seems to me also to be of great importance for classification. Consequently, when *Belostoma* and *Zaitha* differ so markedly in the structure of their male reproductive organs, we must conclude that these genera are by no means so closely related as they have been assumed to be; that in fact it might be proper to separate them into different families. *Zaitha* shows more relationship to *Nepa* in these structural characters than to *Belostoma*.